Attachment C – Guiding Principle s

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Guiding Principle 1:

Support a Single Enterprise-Wide Information Technology Architecture *(Category: Management and Governance)*

Description:

Enterprise-wide, within the context of HCFA's Information Technology Architecture, includes all IT capital assets (hardware, software, licenses, interfaces, etc.) and services existing within the boundaries of HCFA's enterprise. (See Volume 1, Exhibit 1-5, *Scope of HCFA's Information Technology Architecture.*)

Rationale:

Adherence to this principle will enable HCFA to:

- play a strategic and vital role in the health care industry;
- have an Agency-wide, business-aligned and integrated ITA to help fulfill our mission;
- make strategic investment decisions;
- increase interoperability, standardization, and operational effectiveness;
- reduce long-term IT costs;
- link information technology to the business functions as required by the Clinger-Cohen Act of 1996; and
- provide easier access to enterprise data with improved quality.

Implications:

Adhering to this principle requires that HCFA:

- ensure that senior management across the Agency is fully committed to this approach;
- implement processes to instill the necessary cultural changes;
- establish an enterprise-wide governance process to institutionalize policy and standards activities;
- standardize interfaces based upon external constraints;
- design for flexibility to accommodate changing business requirements;
- include business partners more in decision-making processes;
- set appropriate interface standards but not dictate the internal IT infrastructure of our business partners;
- increase the sharing of hardware and software infrastructure resources; and
- budget for the increased short-term start-up cost.

Guiding Principle 2:

Unify Planning, Management, and Governance of the ITA (*Category: Management and Governance)*

Description:

Establishing a common vision among the IT and business components across the enterprise necessitates unifying the planning, management, and governance of the ITA.

Rationale:

Adherence to this principle will enable HCFA to:

- share responsibility for the deployment, operation, and management of technology with all components and stakeholders;
- ensure operational effectiveness by investing in IT in a manner consistent with the requirements of the Clinger-Cohen Act, as well as Department of Health and Human Services and OMB guidance (managing IT assets and expenditures at the enterprise level);
- ensure business unit participation in evaluating and making IT investment decisions using consistent criteria;
- share data, training, and tools across the enterprise, thereby limiting potential duplication of effort;
- maximize the use of IT resources across the enterprise; and
- support the principle of having a single enterprise-wide ITA.

Implications:

Adhering to this principle requires that HCFA:

- engage senior business and IT management, as well as stakeholders, across the enterprise in key decisions that affect development and maintenance of the ITA;
- refocus our centralized IT functions to emphasize establishing policy, standards, and guidance;
- provide strategic systems services that enable the business units to efficiently develop applications in a distributed IT environment;
- develop and promulgate enterprise-wide IT policies and standards;
- routinely review policies and standards for appropriateness;
- institutionalize an enterprise-wide governance process to maintain the ITA and administer policy and standard compliance-review activities;
- impose reasonable constraints on system designs in order to evolve to an enterprise-wide ITA; and
- plan for the increased decision time associated with the establishment of unified planning, management, and governance.

Guiding Principle 3:

Use Guidelines Consistent with the Federal ITA Framework *(Category: Management and Governance)*

Description

HCFA's ITA will be developed and maintained consistent with the guidelines established by the Federal CIO Council Information Architecture Conceptual Model and the Department of Health and Human Services ITA.

Rationale:

Adherence to this principle will enable HCFA to:

- ensure interoperability between the departmental/agency architectures as required by the Federal CIO Council;
- leverage opportunities to share resources with DHHS OPDIVS at reduced costs;
- increase information and data sharing; and
- promote best practices within DHHS.

Implications:

Adhering to this principle requires that HCFA:

- continue to provide proactive representation in the DHHS Information Technology Architecture Group;
- include DHHS ITA compliance verification in our IT review and approval processes;
- phase in or phase out hardware and software standards and technologies in order to achieve compliance with the DHHS ITA; and
- budget for up-front costs to achieve compliance.

Guiding Principle 4:

Maintain a Strategic ITA Outlook *(Category: Management and Governance)*

Description:

Maintaining a strategic ITA outlook is necessary in order to support the strategic business plans of HCFA. The Strategic Plan defines the goals for our business, a set of objectives describing the direction in which we are headed, and the broad strategies we will use in attaining these goals. Establishing long-term IT goals and objectives as part of our strategic ITA outlook is necessary to ensure proper business and IT alignment.

Rationale:

Adherence to this principle will enable HCFA to:

- achieve long-term IT goals and objectives incrementally, while allowing for their evolution over time.

Implications:

Adhering to this principle requires that HCFA:

- develop strategic awareness of the business direction for our staff and relevant IT core competencies;
- establish attainable long-term IT goals, yet allow for flexibility to adjust to changing business goals;
- make investment decisions based upon the strategic ITA goals;
- analyze short-term IT investment decisions for their impact on achieving long-term ITA compliance;
- make short-term IT investment decisions that do not compromise or foreclose on long-term ITA objectives; and
- address possible conflicts arising from the short-term focus of the Federal budgeting process.

Guiding Principle 5:

Develop and Implement IT Projects Using Enterprise-Wide Methodologies *(Category: Applies to all Architectures)*

Description:

HCFA IT projects must be developed, implemented, and operated using standardized, enterprise-wide policies, methods, tools, techniques, etc.

Rationale:

Adherence to this principle will enable HCFA to:

- maximize benefits from the sharing of IT resources (i.e., people, hardware, design techniques, tools, languages, documentation, etc.);
- provide a comprehensive picture of resource utilization throughout the IT project development life cycle;
- implement repeatable software development processes;
- promote redeployment of staff with minimal retraining; and
- minimize the implementation and maintenance costs of developing IT projects.

Implications:

Adhering to this principle requires that HCFA:

- train staff and adjust resources to make them consistent with adopted methodologies;
- change our organizational culture to embrace adopted methodologies;
- employ modern systems development methods (e.g., rapid applications development and/or object-oriented design), tools, and techniques in addition to traditional structured practices;
- document and promulgate adopted methodologies;
- conduct methodology compliance reviews and use sanctions for non-compliance with established methodologies; and
- plan and budget for increased up-front development costs and time.

Guiding Principle 6:

Adopt Open Systems Standards *(Category: Applies to all Architectures)*

Description:

Open systems standards provide the best means of developing applications such that both the design and system implementation are independent of a specific vendor's hardware or software platforms. Products and technologies that are considered compliant with open systems standards use interface specifications that are readily available to all suppliers, service providers, and users, and are revised only with timely notice and public process. Open systems standards allow for continued access to technological innovation supported by many customers and a broad IT industry base. In our approach, however, it is axiomatic that interoperability is more important than openness.

Rationale:

Adherence to this principle will enable HCFA to:

- promote interoperability;
- take advantage of lower costs resulting from vendor competition to differentiate their products within the standards framework;
- easily adapt technology solutions to satisfy changing business requirements while lowering the total cost of IT ownership;
- provide IT solutions that are less susceptible to obsolescence; and
- employ standards that ultimately expand our choices of technology solutions, thereby lessening our dependence on single vendor solutions.

Implications:

Adhering to this principle requires that HCFA:

- focus on standards selection as the basis for product selections;
- set up processes for evaluating products for compliance with standards;
- carefully track the development and evolution of Federal and commercial IT industry standards and their vendor product implementations;
- formulate a workable, prioritized migration strategy for adopting and deploying IT using Federal and industry standards;
- identify criteria for selecting products where no standards have been established;
- avoid implementing proprietary IT solutions unless they are key to providing critical business functionality and no acceptable standard and/or product alternatives exist;
- incorporate standards requirements into acquisition processes; and
- accept sub-optimization of product selections in favor of open systems standards.

Guiding Principle 7:

Enable the Automated, Active Delivery of Information Across the Enterprise *(Category: Information Architecture)*

Description:

The automated, active delivery of important information to a user's desktop is more efficient than requiring users to search for the information they need. Users could identify the particular information they need, and, as soon as it became available, the information could be automatically disseminated to those who need it. Software distribution and installation across the enterprise could also be automated.

Rationale:

Adherence to this principle will enable HCFA to:

- enhance our communication and information dissemination capabilities;
- tailor information to the specific needs of individuals or groups of users, thereby optimizing the sharing of knowledge;
- provide information to users as soon as it becomes available, rather than requiring them to take actions to request the information; and
- reliably provide current information in a timely manner, thereby enhancing our program management decision-support capability.

Implications:

Adhering to this principle requires that HCFA:

- identify user information-access requirements that are best supported using an automated model;
- define the roles and responsibilities of data stewards in information dissemination;
- implement adequate security mechanisms to ensure that users only receive data and information to which they have authorized access;
- develop policies and standards for the automated dissemination of information, and
- invest in appropriate IT infrastructure enhancements that are necessary to implement the required technology.

Guiding Principle 8:

Manage Information and Data as Enterprise-Wide Assets *(Category: Information Architecture)*

Description:

HCFA program operations produce vast amounts of data that must be managed. This massive data collection effort provides the raw material for creating valuable information to support a variety of management, analytical, and research needs throughout the enterprise. Managing information and data as enterprise-wide assets places greater significance on cooperative strategies for satisfying the common information needs of multiple business units across the enterprise, rather than exclusively satisfying parochial component requirements.

Rationale:

Adherence to this principle will enable HCFA to:

- foster the sharing, timeliness, and integrity of information and data;
- increase the security and protection of sensitive information and data;
- optimize resource utilization while eliminating redundant data management costs; and
- increase the quality and consistency of data and information used to support our programs.

Implications:

- Adhering to this principle requires that HCFA:
- clarify the roles and expectations for stewards of enterprise information and data;
- clarify management policies and procedures for identifying and classifying enterprise information and data, as well as standardizing access and security;
- encourage the cultural changes necessary for evolving to an enterprise-wide information and data management environment;
- integrate our infrastructure to permit authorized access to information and data by users enterprise-wide;
- establish an enterprise information resource catalogue of formal data assets;
- employ aggressive safeguards to protect information and data security and privacy;
- enhance our infrastructure to support advanced technologies for metadata management, data replication, and secure computing over the Internet; and
- plan and budget for potentially increased costs for establishing an enterprise-wide data management infrastructure.

Guiding Principle 9:

Design and Develop Application Software Components for Reusability and Platform Independence *(Category: Application Architecture)*

Description:

This principle emphasizes two main characteristics of open systems standards: designing application software as components of an overall system, and designing components for reusability and platform independence. Together, these concepts constitute the minimum requirements for designing and deploying adaptable IT solutions that are capable of evolving with business needs.

Rationale:

Adherence to this principle will enable HCFA to:

- leverage available processing platform resources;
- increase application development productivity and responsiveness to business needs;
- reduce complexity and enhance functional and technical systems integration by using modular design components;
- promote standardized application system design;
- expand reusability beyond sharing code to sharing business processes, system designs, tools, documentation, etc.;
- reduce costs; and
- promote consistency and stability of deployed systems.

Implications:

Adhering to this principle requires that HCFA:

- plan for migrating application development methods to employ tools and techniques that facilitate sharing, reuse and platform independence;
- establish policies, standards, and procedures for promoting the sharing and reuse of source code, application designs, documentation, etc.;
- identify the reusable portions of application logic as distinct from logic specific to particular business processes;
- establish and maintain a library of reusable, shareable components;
- establish interface standards for sharing reusable components;
- develop an architecture model that specifies a layered, modular, platform–independent application design structure;
- evolve to an object-oriented application development approach;
- design modular application components that are loosely coupled and are capable of being partitioned;
- design common system functions and services that are independent of specific application processing requirements and platforms; and
- establish and enforce logical partitions between applications, data management, and systems services within application designs.

Guiding Principle 10:

Use Custom-Developed Software Instead of Commercial/Government off-the-Shelf Products Only When Warranted and Justified *(Category: Application Architecture)*

Description:

Preference will be given to acquiring COTS or GOTS software products in lieu of developing custom application solutions to business requirements. COTS and GOTS products can range in size and functionality from component functions that "plug" into the existing systems infrastructure, to entire application systems, to enterprise resource systems (e.g., products like SAP, Peoplesoft, BAAN, etc.). Industry trends toward increased software development costs are likely to continue instead of abate, and the appropriate use of COTS and GOTS products is one way to acquire needed IT capabilities in a cost-effective manner. Where using existing components is both possible and feasible, it is no longer acceptable for Federal agencies to specify, build, and maintain comparable custom solutions.

Rationale:

Adherence to this principle will enable HCFA to:

- enhance our business and mission effectiveness by exploiting technology solutions that are widely available to customers, partners, and stakeholders;
- leverage previous and future investments of public and private sector resources that are committed to sustaining working IT solutions to common business needs;
- ease our software maintenance burden, and reduce software development risk; and
- benefit from the continually expanding variety of COTS and GOTS technology solutions becoming available to all users.

Implications:

Adhering to this principle requires that HCFA:

- define software development methods and practices for IT staff to incorporate COTS and GOTS considerations into systems life-cycle processes;
- retrain and retool IT staff to use new COTS- and GOTS-related skills as necessary;
- define systems development life-cycle processes and procurement standards to be consistent with this principle;
- define IT investment decision criteria to weight more favorably the funding for IT projects that employ COTS or GOTS solutions;
- acquire only those COTS and GOTS products that incorporate open systems standards-compliant interfaces;
- avoid the increased risk and cost associated with using purchased products that require changing the source code in order to be implemented;
- acquire COTS and GOTS products only from stable, reliable vendor sources;
- participate in user groups to influence product enhancements and priorities;
- establish a comprehensive product-evaluation process to ensure that candidate solutions adequately satisfy business requirements; and
- give up a measure of control and accept the risk of product changes by the vendor.

Guiding Principle 11:

Leverage Enterprise-Wide Licensing of Vendor Products *(Category: Infrastructure Architecture)*

Description:

Procuring IT products and services from vendors by negotiating enterprise-wide licensing is a cost-effective strategy that leverages the purchasing power of organizations, resulting in a win-win for both parties. Customers benefit from enterprise-wide licensing by paying a lower per-unit cost for products and services and spending less time on procurement actions as compared with piecemeal acquisitions. Vendors prefer enterprise license purchases by their customers because such purchases often result in higher revenue per sale and a more substantial commitment to the vendor's product by the customer. Recent reforms in Federal procurement guidelines permit more flexibility to negotiate IT acquisitions to the advantage of the Government, with the public being the ultimate beneficiary. Without an enterprise-wide approach, groups within mid- to large-size organizations often purchase IT products piecemeal, in isolation, unaware that other parts of the organization either already use or require the same product. Where feasible, HCFA will acquire new IT through enterprise-wide license negotiations, and will consolidate multiple group and individual licenses into enterprise-wide licenses.

Rationale:

Adherence to this principle will enable HCFA to:

- benefit from cost-sharing across organizational components;
- lower overall IT costs by leveraging our buying power;
- increase our negotiating leverage with vendors;
- benefit from economies of scale;
- improve our understanding, oversight, and management of IT product and service licenses;
- simplify and reduce the administrative burden;
- simplify and enhance our vendor relationships and interactions; and
- satisfy our IT product and service requirements as a whole.

Implications:

Adhering to this principle requires that HCFA:

- establish guidelines and metrics for assessing the benefits of enterprise license opportunities;
- identify and adopt best practices for enterprise IT acquisitions; and
- focus responsibilities and improve procedures for coordinating technology acquisitions.

Guiding Principle 12:

Promote the Use of Web-Based Technology *(Category: Infrastructure Architecture)*

Description:

The Internet and its related Web-based technologies are the most significant advancements in information systems in the last five years. The Internet, Intranets, and Extranets offer new channels for enhanced communication directly between customers and suppliers. As Web-based technologies continue their rapid evolution, they set new standards and establish new paradigms for using computers and networks to solve business problems. Where feasible, we will incorporate the use of Web-based technologies (i.e., the Internet, Intranets, and Extranets) in designing and deploying IT solutions to support HCFA's program needs.

Rationale:

Adherence to this principle will enable HCFA to:

- enhance information dissemination to customers, stakeholders, and partners;
- open new channels for interacting with customers, stakeholders and partners (e.g., beneficiaries, providers, insurers, and other public and private sector organizations);
- exploit an existing, widely available, and continually expanding network infrastructure and technology base; and
- design applications for computing-platform independence using Web-based technology.

Implications:

Adhering to this principle requires that HCFA:

- acquire adequate resources and skill sets for developing and deploying Web-based IT solutions;
- implement processes for developing and promoting appropriate Web-based applications and information content;
- implement a robust security infrastructure for applications and data access; and
- keep abreast of standards influencing the use and future direction of Web-based technology.

Guiding Principle 13:

Design and Deploy Application Systems Using a Client/Server Model *(Category: Infrastructure Architecture)*

Description:

In a client/server model, application processes are divided between two or more logically partitioned environments, typically a client system (e.g., a program or intelligent workstation) and a server system. Both components engage in cooperatively processing the application functions. Client and server hardware and software components tend to be specialized by design to perform their intended functions. Client/server computing is typically performed with distributed computing platforms over geographically dispersed locations connected by a network. This combination of computing platforms and communications networks is the key enabling element of modern information systems.

Rationale:

Adherence to this principle will enable HCFA to:

- design modular, adaptable systems that leverage the inherent flexibility of client/server computing;
- increase processing efficiency by distributing processing over multiple platforms;
- benefit from reduced costs in acquiring IT systems due to advantageous-price/performance computer platforms and robust telecommunications technology;
- exploit the evolution of standards toward open systems;
- increase systems availability and reliability through distributed processing capabilities that reduce the single point of failure associated with mainframe-centric computing; and
- improve response time and access to information system resources.

Implications:

Adhering to this principle requires that HCFA:

- acquire and adopt the range of technical skills necessary to effectively develop and deploy IT systems in a client/server architecture;
- identify and adopt industry best practices for client/server and distributed computing architectures;
- deploy reliable, robust systems and network management capabilities to maintain a distributed computing environment; and
- plan for the initial increase in cost associated with acquiring the technologies and skills needed to establish a client/server computing environment.

Guiding Principle 14:

Ensure Enterprise-Wide Integration of IT Security *(Category: Security Architecture)*

Description:

Security is the responsibility of every HCFA employee, agent, and business partner. Federal regulatory mandates and directives require HCFA to implement appropriate administrative, technical and physical safeguards to ensure the security and confidentiality of sensitive data and information against unauthorized access and use. HCFA has a responsibility to protect the sensitive data and information it collects against anticipated threats or hazards that could result in substantial harm to any individual on whom the information is maintained. Without an integrated approach to security implementation, we cannot ensure that our policies, procedures, and technologies adequately protect the enterprise against known security threats. However, as a practical matter, the cost of implementing adequate security safeguards should not exceed the liability risk, or create unnecessary barriers to information access by authorized users.

Rationale:

Adherence to this principle will enable HCFA to:

- fulfill our mandatory responsibility to safeguard sensitive personal information;
- develop a comprehensive approach to security design and implementation that is adequate for the scope of our business enterprise, which is a broadly distributed, networked environment;
- provide access to the needed information and data to authorized persons only, regardless of where they are located within the enterprise;
- improve auditing and accountability of access to sensitive data and information;
- uniformly implement security standards enterprise wide; and
- exploit available and emerging technologies that strengthen the implementation of security using an enterprise-wide approach.

Implications:

Adhering to this principle requires that HCFA:

- develop security implementation strategies from an enterprise-wide perspective;
- define consistent roles, responsibilities, and expectations for system managers, application developers, and security administrators enterprise wide;
- ensure that central IT organizations take the lead in formulating enterprise-wide security policy, providing guidance, and performing compliance audit activities;
- develop effective programs to test the adequacy of security implementation measures;
- continually monitor the enterprise for vulnerabilities and threats/risks as the IT environment evolves over time;
- identify industry best practices for integrating systems security technology, methods, and procedures consistently throughout the enterprise; and
- plan for the increased cost of implementing an enterprise-wide security strategy.

Guiding Principle 15:

Deliver Centralized IT Support Services Throughout the Enterprise *(Category: Systems Management Architecture)*

Description:

Centralized IT support services comprise systems and network management capabilities necessary to maintain a distributed computing environment. In order to maintain business continuity, these services must be monitored and coordinated from a single point. Centralized IT support services provide people, procedures, and tools to maintain the integrity and efficiency of computing resources throughout the enterprise to ensure proper planning, systems deployment, and problem resolution. The scope includes network management, resource management, and systems and security administration. This increased scope reflects the management of IT resources across technology domains and/or vertical business functions to guarantee that the availability and capabilities of the IT delivery systems can fulfill user expectations.

Rationale:

Adherence to this principle will enable HCFA to:

- reduce the total cost of ownership (TCO) and management of IT resources; and
- improve the quality, efficiency, and effectiveness of IT service through centrally coordinated, comprehensive management of our distributed computing environment.

Implications:

Adhering to this principle requires that HCFA:

- invest in solutions that improve centralized IT management and operational efficiency rather than increase staff personnel costs;
- retrain and redeploy staff as appropriate to implement a centralized IT management environment;
- specify application and infrastructure architectures that enable the design and implementation of standard systems management technology interfaces;
- implement enterprise-wide service-level agreements to ensure that IT services and performance adequately support the needs of business operations; and
- establish appropriate metrics for monitoring and measuring the efficiency and performance of centralized IT services.